

## CLAIMS

The invention claimed is:

1. A hot water recirculation system, comprising:
  - a source of hot water;
  - a fixture remote from the source and configured to dispense hot water;
  - a fluid circuit extending from the source to the fixture for delivering hot water to the fixture, and returning to the source for recirculating hot water in the fluid circuit back to the source for reheating;
  - a fluid pump for recirculating hot water through the fluid circuit; and
  - an electrical circuit sensor configured to detect operation of an electrical circuit proximate the fixture and associated with a user operating the fixture, and further configured to initiate operation of the fluid pump responsive to detected operation of the electrical circuit to initiate hot water recirculation.
2. The hot water recirculation system of claim 1 wherein the source of hot water comprises a hot water tank and heater.
3. The hot water recirculation system of claim 1 wherein the fixture comprises a bathroom hot water fixture and the electrical circuit sensor is configured to sense current flow through a bathroom light circuit responsive to a user turning on a light of the light circuit.
4. The hot water recirculation system of claim 3 wherein the bathroom fixture comprises a sink hot water faucet.

5. The hot water recirculation system of claim 3 wherein the fixture comprises a shower/tub hot water faucet.

6. The hot water recirculation system of claim 1 wherein the fixture comprises a kitchen hot water faucet and the electrical circuit sensor is configured to sense current flow through a kitchen light circuit responsive to a user turning on a light of the light circuit.

7. The hot water recirculation system of claim 1 wherein the electrical circuit sensor comprises a relay associated with an electrical wire of the electrical circuit.

8. The hot water recirculation system of claim 7 wherein the relay is a solid state doughnut-type relay that encircles the electrical wire.

9. The hot water recirculation system of claim 8 wherein the relay is mounted within a fuse box electrical panel.

10. The hot water recirculation system of claim 1 further comprising a check valve provided in the fluid circuit to impart one-way fluid flow through the fluid circuit.

11. The hot water recirculation system of claim 1 wherein the source of hot water comprises a hot water tank, the fluid circuit extends from a hot water outlet port of the hot water tank alongside a plurality of fixtures, through the fluid pump, and back to a water inlet port of the hot water tank.

12. The hot water recirculation system of claim 11 further comprising a pair of shutoff valves provided on either side of the fluid pump and configured to isolate the fluid pump to enable maintenance, repair and/or removal of the fluid pump from along a fluid circuit.

13. The hot water recirculation system of claim 1 further comprising a main water supply line entering the fluid circuit upstream of the source of hot water and downstream of the fluid pump, and further comprising a check valve provided in the main water supply line to prevent introduction of recirculated hot water back into the main water supply line from the fluid circuit.

14. The hot water recirculation system of claim 7 wherein the relay is configured to detect operation of an electrical power supply wire to a dishwashing machine.

15. The hot water recirculation system of claim 7 wherein the relay is configured to detect operation of an electrical power supply wire to a clothes washing machine.

16. A system for initiating hot water recirculation, comprising:  
a hot water tank communicating with a device for heating water;  
a hot water fixture disposed from the hot water tank and configured to dispense hot water to a user;  
a hot water fluid conduit comprising a hot water pipe loop extending from the hot water tank to the fixture and back to the hot water tank to enable passage of hot water

in a single direction through the fluid conduit to the fixture and back to the hot water tank for reheating;

a hot water pump disposed in the fluid conduit downstream of the fixture and proximate the hot water tank and configured to recirculate hot water through the fluid conduit and back into the hot water tank for reheating; and

an electrical power relay configured to detect current flow through an electrical power circuit for a fixture proximate and associated with the hot water fixture and further configured to initiate power delivery to the hot water pump responsive to the relay detecting operation of current flow through the electrical circuit to initiate hot water recirculation.

17. The system of claim 16 wherein the relay is provided on a kitchen light switch and the hot water fixture comprises a hot water faucet of a kitchen sink.

18. The system of claim 16 wherein the fixture comprises a hot water faucet in a bathroom sink, the relay is configured to detect current flow of an electrical wire between a bathroom light switch and an electrical panel.

19. The system of claim 16 wherein the fixture comprises a hot/cold water faucet of a shower, and the relay is configured to detect current flow of an electrical wire between a bathroom light switch and a supply of electricity.

20. The system of claim 16 wherein the hot water fixture comprises a hot water supply line to a dishwasher, and the relay is configured to detect current flow through an electrical wire supplying power to the dishwasher.

21. The system of claim 16 wherein the hot water fixture comprises a hot water supply to a clothes washer, and the relay is configured to detect current flow through an electrical wire supplying power to the clothes washer.

22. A method for recirculating hot water through a continuous loop fluid circuit, comprising:

providing a source of hot water disposed within a continuous loop fluid conduit with at least one fixture disposed along the fluid conduit;

detecting operation of an electrical circuit proximate the fixture and associated with a user operating the fixture; and

in response to detecting operation of the electrical circuit, recirculating hot water through the fluid conduit.

23. The method of claim 22 wherein detecting operation of an electrical circuit comprises detecting current flow through an electrical wire of a light switch circuit.

24. The method of claim 22 wherein detecting operation of an electrical circuit comprises detecting current flow through a power supply wire to an electrical appliance.

25. The method of claim 22 wherein detecting operation of an electrical circuit comprises detecting current flow through an electrical wire using a relay provided in association with the electrical wire.